

AMENDMENTS TO THE CLAIMS

1-25. (Cancelled)

26. (Currently Amended) A reactor for electrochemically processing a microelectronic workpiece comprising:

one or more walls defining a processing space for containing a processing fluid, the one or more walls forming a processing cup having an open top;

a microelectronic workpiece support including one or more conductive members disposed to electrically contact the microelectronic workpiece to provide electrical power for electrochemical processing of the microelectronic workpiece, the microelectronic workpiece support being disposed proximate the open top of the processing cup to bring at least one portion of the microelectronic workpiece into contact with the processing fluid for electrochemical processing;

an electrode housing disposed in the processing cup and having an end that opens toward the microelectronic workpiece support, the electrode housing having an interior region configured to receive at least one electrode;

a pressure drop member disposed over the open end of the electrode housing;

a first fluid inlet, and a first fluid outlet in fluid communication with the interior region, and a fluid tube coupled to the first fluid outlet, wherein the fluid tube contains fluid from the first fluid outlet to the interior region to outside of the reactor;
and

a second fluid inlet and a second fluid outlet in fluid communication with the processing space exterior to the interior region, wherein fluid from the process space exits the reactor via the second fluid outlet directing processing fluid from the reactor separately from the first fluid outlet tube.

27. (Previously Presented) A reactor as claimed in claim 26, further comprising the at least one electrode, and wherein the at least one electrode comprises an anode in the electrochemical processing of the microelectronic workpiece.

28. (Previously Presented) A reactor as claimed in claim 26, further comprising the at least one electrode, and wherein the at least one electrode comprises a cathode in the electrochemical processing of the microelectronic workpiece.

29. (Cancelled)

30. (Cancelled)

31. (Original) A reactor as claimed in claim 26 wherein the pressure drop member comprises a permeable membrane.

32. (Original) A reactor as claimed in claim 31 wherein, the permeable membrane is conical in shape having an apex directed toward the interior region of the electrode housing.

33. (Original) A reactor as claimed in claim 26 wherein the pressure drop member is conical in shape having an apex directed toward the interior region of the electrode housing.

34-48. (Cancelled)

49. (Currently Amended) An apparatus for use in electrochemical processing of a microelectronic workpiece comprising:

a reactor having a processing space containing processing fluid;

an electrode assembly disposed in the processing space and comprising:

an electrode housing having an open end;
a pressure drop member disposed over the open end of the electrode housing, the electrode housing and pressure drop member defining an electrode chamber with an interior region;
an electrode disposed in the interior region of the electrode chamber;
a first fluid inlet, ~~and a first fluid outlet in fluid communication with the interior region, and a fluid tube coupled to the first fluid outlet, wherein the fluid tube contains fluid from the first fluid outlet to the interior region to outside of the reactor;~~ and
a second fluid inlet and a second fluid outlet in fluid communication with the processing space exterior to the interior region, wherein fluid from the process space exits the reactor via the second fluid outlet directing processing fluid from the reactor separately from the first fluid outlet tube.

50. (Original) An apparatus as claimed in claim 49 wherein the pressure drop member comprises a permeable membrane.

51. (Original) An apparatus as claimed in claim 50 and further comprising a membrane frame disposed over the open end of the electrode housing, the permeable membrane being connected to the membrane frame.

52. (Original) An apparatus as claimed in claim 49 wherein the pressure drop member has a conical shape with an apex directed toward the interior electrode chamber.

53. (Cancelled)

54. (Cancelled)

55. (Previously Presented) The reactor of claim 91 wherein the membrane has a generally conical shape, with an edge region of the membrane disposed closer than a central region of the membrane to the workpiece support.

56. (Previously Presented) The reactor of claim 91 further comprising a flow distribution element having a multitude of openings through which at least one of the processing fluids can flow.

57. (Previously Presented) The reactor of claim 91 further comprising a shield positioned between the first and second electrodes, the shield having a rim and an opening disposed annularly inwardly from the rim.

58. (Previously Presented) The reactor of claim 57 wherein the shield is part of a field shaping element.

59. (Previously Presented) The reactor of claim 91, further comprising the microelectronic workpiece.

60. (Previously Presented) The reactor of claim 91, further comprising the first and second processing fluids.

61-90. (Cancelled)

91. (Currently Amended) A reactor for electrochemically processing a microelectronic workpiece comprising:

a fluid vessel;

an ion selective membrane positioned in the vessel between a first fluid flow region and a second fluid flow region;

- a first fluid flow entry positioned to provide a first processing fluid to the first fluid flow region;
- a first fluid flow exit positioned to remove the first processing fluid from the first fluid flow region and a fluid tube that contains the first fluid flow from the first fluid flow exit to outside of the reactor;
- a first electrode in fluid communication with the first fluid flow region;
- a second fluid flow entry positioned to provide a second processing fluid different than the first processing fluid to the second fluid flow region;
- a second fluid flow exit positioned to remove the second processing fluid from the second fluid flow region, wherein the fluid from the process space exits the reactor via the second fluid flow exit ~~directing the second processing fluid to exit the reactor separately from the first processing fluid~~fluid tube; and
- a second electrode positioned to contact the microelectronic workpiece while the second electrode and the microelectronic workpiece are in fluid communication with the second fluid flow region.

92. (Previously Presented) The reactor of claim 91 wherein the ion selective membrane is only permeable to at least one ionic species of at least one of the first and second processing fluids.